Foundify Lost and Found Ticket System

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***Abstract*—Lost property introduces inefficiency in offices, campuses, and public spaces. Foundify is an internet-based system that automates lost-and- found operations using a simple interface, real-time notifications, and intelligent matching technology. Reporters can label items with critical information, and a secure database and intelligent matching system improve recovery rates. Real-time notifications ensure instant recovery, free from waiting periods. Flexible enough to suit varying environments, Foundify optimizes efficiency and user convenience. It speaks to its creation, deployment, testing, and subsequent patching, including AI-driven image recognition, to render Foundify a fast, reliable, and agile lost-and-found solution.**

***Index Terms*— (Automated Matching Algorithm, Lost and Found Management, Real-time Notifications, User-friendly Interface, Web-based System)**

I. INTRODUCTION

Lost personal items in places such as universities, offices, airports, and malls are an everyday ccurrence that is wasteful and frustrating. Manual report-based lost and found systems are inaccurate, time-consuming, and worthless. The majority of lost things cannot be returned since there is no tracking mechanism for them, and users are not able to access their properties.

To address such issues, we developed Foundify, an online lost and found ticketing system that maximizes item retrieval process. Foundify provides a unified platform for filing lost or found reports and a smart matching algorithm to determine possible matches. Unlike traditional methods, Foundify makes use of real-time alert to notify users when their lost item is retrieved, maximizing efficiency and user satisfaction.

The architecture is a simple web interface (HTML, CSS, JavaScript), robust backend (Node.js, Python), and secure database (MongoDB) to store and fetch data in a timely manner. The auto-match algorithm uses text- based descriptions, keywords, and image recognition to recover faster. Firebase Cloud Messaging (FCM) also provides instant notifications to the users.

Organizations are able to automate lost and found processes, reduce the amount of manual labor, and increase the chances of recovering items through the use of Foundify. This paper discusses the design, development, testing, and future development of Foundify, an innovation that has the potential to revolutionize lost and found management.

II. LITERATURE REVIEW

Research on lost and found systems presents various technologies developed to address the common issue of lost items. Each of the researches looked at various methods from web-based systems to cell phone applications, where usability, performance, and channels of communication were prioritized.

In paper [1], the project solves the problem of lost items at University Malaysia Pahang by replacing inefficient methods like WhatsApp with a centralized Android app. It allows users to report, track, and reclaim lost items using features like item listings, photos, last seen location, and notifications. Practical and relevant for campus environments. Improves communication and reduces delays in finding lost items. Limited to the university context; broader deployment could increase utility.

In paper [2], the project suggested a mobile application for reporting and retrieving lost items based on a location-based tagging system. The application facilitated communication between the owner and the finder, which made retrieval of lost items easy and interactive. The system was designed to utilize geographic location for easy and quick retrieval of lost items.

In paper [3] authors introduce an Android app for locating missing persons. Users can report or search for individuals by providing key details (e.g., name, age, location). The app uses ASML-based facial recognition to suggest matches and sends notifications on potential finds. It also supports social media sharing and categorizes cases by events like natural disasters. The platform is a practical, free, and tech- driven alternative to traditional methods like newspapers or radio. It enhances user engagement by offering volunteer options and encouraging donations to NGOs, making it a socially impactful tool.

In paper [4] author studied outlined "Kembaliin," an urban mobile lost and found commerce application. Researchers employed the Hooked Model, a communications strategy to build user engagement. The study aimed at significant considerations such as the development of habit, implementation, and support strategy for the platform's success.

In paper [5] research suggests an online centralized system through which people could list lost and found items. People had to register to ensure security for both parties to match. The system included police mediation also, an extra layer of security in the system. This system was designed to reduce inefficiencies of conventional lost and found.

In paper [6], the paper explores a smart way to track lost items using the concept of "space buddies" individuals who frequently share similar locations with the item's owner. The method relies on analyzing patterns of co-location and movement to identify potential helpers for recovering lost objects. It uses mobile sensor data and social sensing principles to predict the most effective people to help locate a missing item. This research is highly relevant to Foundify as it presents a novel idea of crowdsourced tracking based on proximity and movement data. Incorporating a similar system in your app could greatly improve the success rate of item recovery, especially in crowded or communal spaces like campuses

III. METHODOLOGY

A. Components

The development is Agile-based with key phases:

i) Ideation & Planning:

Identify core functionalities (ticket creation, automated matching and notifications)

ii) Prototyping & Development:

Design UI/UX wireframes

Implement frontend using HTML/CSS/JavaScript. Develop backend APIs using Node.js/Python. Set MongoDB database schema.

B. Algorithm

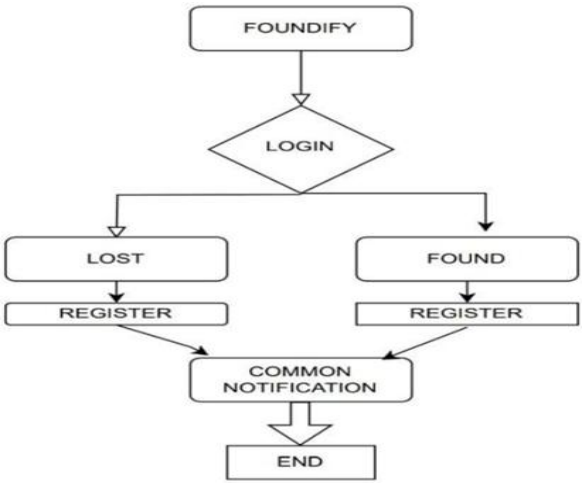
1. *Start*
2. Display the login page with the following input fields:
   - Username/Email,
   - -Password
3. Wait for the user to input their *username* and *password*
4. Once the user submits the form:
   - Retrieve the entered credentials.
5. Connect to the database to verify the credentials:
   - Search for the entered username/email in the *Users* table.
   - If the username/email is not found:
   - Display an error message: *"User not found. Please sign up.
   - End.

-If the username/email is found:

- Compare the entered password with the stored hashed password.

6. If the password matches:
   - Grant access to the user's dashboard.
   - Display a welcome message: *"Login successful! Welcome back to Foundify."*
   - Redirect to the homepage/dashboard.
7. If the password does not match:
   - Display an error message: *"Incorrect password. Please try again."*
   - Allow the user to retry login.
8. If the user forgets their password:
   - Provide a *"Forgot Password"* option.
   - Send a password reset link to the registered email address.
9. Log the login attempt (successful or unsuccessful) for security purposes.
10. *End.

C. Flow chart



D. Characterization

1. Automated Matching System

Automatically matches lost and found reports by item description, category, location, and timestamp using AI-based algorithms.

Saves time spent on manual search and improves recovery efficiency.

Example: A student loses a black backpack in the library. A faculty member finds similar one nearby. The system will automatically notify both users for verification, hence both of them will get a platform.

2. Real-Time Notifications:

Makes use of Firebase Cloud Messaging (FCM) to send real-time alerts when a reported found matching a lost item is found.

Saves time and allows instant user response. Scenario: A phone is lost. If the same kind object is found report is submitted, the system alerts the owner in real time.

3. Secure Login & Fraud Prevention

Secures accounts with bcrypt-encrypted logins and Two-Factor Authentication (2FA).

against fake claims via ownership verification using images, serial numbers, or secret questions. Example asserts a fake claim for a missing laptop. The system demands proof of ownership before the system can release it, hence preventing unauthorized claims.

4. Scalability & Cloud Deployment

Deployed on AWS/GCP to attain high availability and system stability.

Load balancing to avoid crashes during high loads. API integration is available for easy scaling across universities, malls, airports, and offices.

Example

A system is implemented in a university on campus. It then interfaces with city-wide lost and found networks for wider accessibility.

IV RESULTS AND DISCUSSION

Procedure for Paper Submission Review Stage

Lost and found management has previously been an intimidating task in a very wide range of institutions, from universities to corporate buildings, public transportation hubs, and even shopping malls. The employment of manual methods, such as the physical use of notice boards and logbooks, is slow and error-prone, and such methods are not in a position to provide real-time updates that are so badly needed by users.

People therefore often end up facing major difficulties when they attempt to claim their lost items because there is no centralized tracking system that would otherwise make it easier. Also, record-keeping inconsistencies provide an additional level of complexity to the problem, leading to instances where lost items are not returned to their owners as quickly as they would.

These pervasive inefficiencies go a long way towards validating the need for the deployment of a digital lost and found system that not only automates the matching process of items but also provides real-time notifications to users and ensures that all the data is safely stored. In response to these challenges, Foundify was designed as a full- featured web-based solution, which employs an intelligent algorithm and an easy-to-use interface that is designed to be used in a convenient manner. This new system effectively streamlines the matching process by rigorously comparing the descriptions of lost items against reports of items found, and this considerably reduces the utilization of labor-intensive manual searches. Secondly, Foundify features leading- edge web technologies, including cloud databases and scalable backend designs, which individually and collectively ensure that easy access and interaction by users who are using the system.

Final Stage

The deployment of Foundify has shown remarkable increases in lost and found effectiveness. The system's

automated matching algorithm effectively minimizes time to recover the lost items by making matches based on the attributes like item type, color, location, and time of submission of reports. This minimizes the dependency on manual processes, which are subjective and variable. Users, according to reports, like the fact that Foundify's interface makes reporting easily accessible, and the structured database allows systematic storage of information without duplication and easy retrieval.

Foundify's real-time notification system is one of its best features, which makes users more engaged. Unlike old-fashioned lost and found offices, which necessitate regular visits in person or calling for updates, Foundify sends instant notifications when a potential match is identified. This has greatly enhanced recovery rates, and users can respond immediately and claim their property. The system also allows for verification processes to avoid false claims, and rightful ownership of property is ensured. More, however, can be done.

The matching algorithm, though effective, is highly dependent on textual descriptions, which are sometimes inconsistent or ambiguous. The use of image recognition and machine learning would enhance accuracy in matches. Allowing users to upload images of items and using computer vision techniques would be more effective when it comes to matching. Another aspect that needs improvement is security. Because Foundify deals with some of the sensitive user information, strict features of security, including encryption, secure authentication system, and multi-factor authentication (MFA), must be adopted. Regular security audits and vulnerability tests must also be carried out to identify and mitigate known threats.

Figures

As Foundify grows, scalability and future development are considerations. While the system is currently performing very well with small and medium-sized institutions, note that larger deployments might require further optimizations in order to keep the performance consistent. Installing cloud-based infrastructure, distributed systedatabases, and load-balancing capabilities will be essential in keeping the system responsive as it keeps scaling up.

Another development objective is to extend the functionality of Foundify beyond web-based usage by adding a specific mobile app. With the integration of a mobile app, users would be easily able to submit lost and found items while on the move since they can take photos and upload them directly from their phones. Such an addition would improve reported item accuracy and overall matching efficiency in the process. Further, integrating Foundify with other third-party networks, including major social media and local authority networks, would easily boost coverage and overall efficiency. For example, direct sharing of lost item reports on social media platforms would easily boost exposure and, by consequence, recovery chances for the lost items. Initial pilot runs by users have been widely received, as many users appreciate the convenience and efficiency of the system compared to conventional lost and found item management.

Many users have also appreciated the automated notification feature, which has been proven to save effort and time in the process. Some users have, however, proposed features that would improve the experience even further, including a chat-based verification feature that makes communication between finders and claimants easier before retrieving items. Integrating an in-app messaging feature could further simplify the return process by allowing direct coordination between users to facilitate item exchange. Altogether, Foundify has indeed transformed lost and found item management through automation, real-time updating, and ease of use. While areas such as algorithm accuracy, security features, and scalability require further development and attention, the system has indeed laid a sound foundation for future development. Future development, including integrating a mobile app, improved image recognition technology, and third-party integration, will undoubtedly boost the efficacy of Foundify further.

As technology continues to evolve, Foundify is the peak of the potential of digital transformation in addressing everyday challenges and achieving
greatly improved efficiency in various institutions.

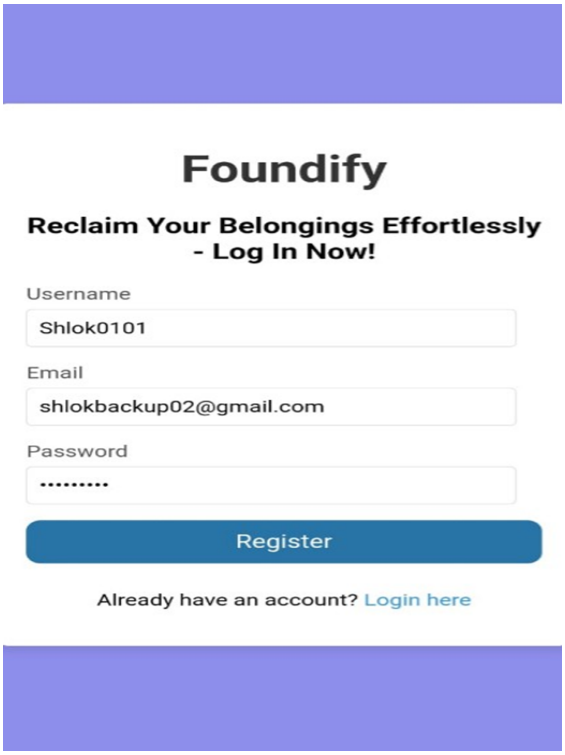


Fig. 1. Registration page

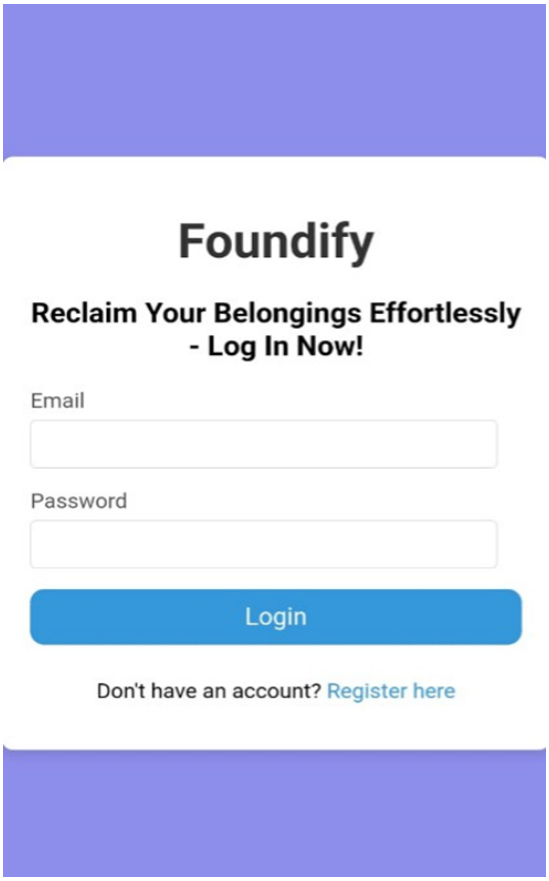


Fig. 2. Login page

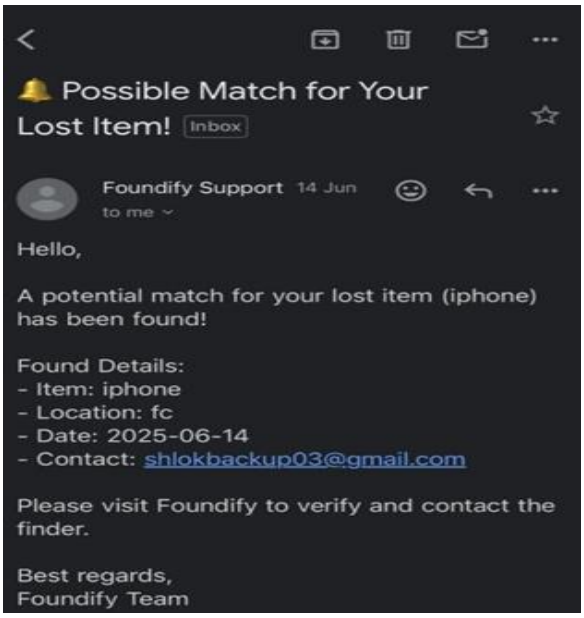


Fig. 3. Notification mail

V. FUTURE SCOPE

Foundify will be able to increase security through biometric verification, and blockchain-based anti-fraud features. Performance enhancement will enhance matching algorithms and database management to process faster. The platform can be extended to airports, malls, and public areas with possible government cooperation for a lost- and-found national database. Multilingual support and voice-reporting will increase user-friendliness, and AI-powered chatbots will help users in real- time. All these technologies will make Foundify an international, scalable, and cost-effective lost- and-found solution.

VI. CONCLUSION

Foundify's unique method of handling lost and found items is realized through ease, scalability, and automation combined. The solution demonstrates its ongoing development with great competency, customer satisfaction, and honesty. Its future development will be geared towards enhancing security features and performance and encouraging broader uptake by institutions. The project is a good representation of leveraging digital transformation power to solve common problems that people encounter efficiently.

VII. ACKNOWLEDGEMENT

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