

An Assistive Tool for Finding Lost Items: A Review

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Abstract - This paper presents the development and implementation of the Lost and Found app for Chandigarh University (CU). The aim of the project is to enhance the efficiency and effectiveness of the lost item management process within the campus premises. The project encompasses the creation of two mobile applications: one designed for students and the other for CU administrators. The Student App provides students with a user-friendly platform for submitting, searching for, and claiming lost items. It streamlines the process, making it more accessible and convenient for students who have lost their belongings. On the other hand, the CU Admin App equips administrators with tools to upload found items, verify claims, and establish efficient communication with students. The primary objectives of the project are to improve the overall efficiency of the lost and found process, enhance accessibility to information about lost items for students, streamline the verification process for item claims, and establish a robust communication channel between students and administrators.

Keywords - Lost&Found, Chandigarh University, App Development, Flutter Development, UI/UX Designing

I. INTRODUCTION

The client for this project is Chandigarh University (CU), a prominent institution of higher education and the students pursuing education from the University. CU represents the administrative body responsible for overseeing the campus and addressing the needs of its students and staff. The need for this project arises from a recurring issue within the university campus—lost and found items. As CU continues to grow and welcome students from various backgrounds and locations, instances of personal belongings being misplaced or forgotten have become more frequent. This necessitates an

efficient system to manage lost and found items, addressing the needs of both students and the administrative team. Chandigarh University's sprawling campus and diverse community result in an environment where individuals may inadvertently leave behind their personal items in various

locations, such as classrooms, libraries, cafeterias, or common areas. These items may include mobile phones, wallets, laptops, textbooks, and other valuables.

In the contemporary landscape, technology has become an integral part of addressing everyday challenges. The proposed Lost and Found app aims to leverage technology to address the persistent issue of lost and found items within educational institutions. In doing so, it aligns with a relevant contemporary issue—improving administrative processes through digital solutions. As technology continues to evolve, its application in solving real-world problems has become increasingly evident. This includes optimizing processes within educational institutions, where efficiency and convenience are paramount. Traditional lost and found systems, reliant on manual record-keeping and physical notices, often struggle to keep pace with the demands of a growing campus community.

The problem that this project seeks to address revolves around the inefficiencies and limitations of the current Lost and Found system at Chandigarh University (CU). As with many educational institutions, CU faces an ongoing issue of students and staff members misplacing or inadvertently leaving behind their personal belongings within the campus premises.

The existing manual system for managing lost and found items is highly inefficient. It relies on a labour-intensive process of collecting physical items, recording their details, and maintaining paper records. This process is prone to errors and delays, making it challenging to promptly reunite lost items with their rightful owners. The inefficiencies in the current system can lead to frustration and inconvenience for both the individuals who have lost their items and the administrative staff responsible for handling these cases. Under the current system, students and staff members often struggle to access information about lost items. Since the information is typically maintained in a physical ledger or through notices posted on bulletin boards, individuals may not be aware of the availability of their lost items. This lack of centralized information accessibility can hinder the quick recovery of lost

belongings. Verifying ownership of lost items is a complex and time-consuming process in the current system. To claim a lost item, an individual must physically visit the lost and found office, describe the item, and provide evidence of ownership.

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ownership. This requirement can be particularly inconvenient for individuals with busy schedules or those who have lost items in different locations across the campus. The communication between students or staff members who have lost items and the administrative team responsible for managing the lost and found process can be disjointed. There is often no centralized platform for reporting lost items, tracking their status, or receiving updates on the progress of the recovery process.

II. WORK

Development of Two Apps

A. Student App

This app is designed to cater specifically to the needs of the student community at Chandigarh University. It will provide students with the functionality to:

- **Submit Lost Items:** Students should be able to physically submit lost items to the CU administrators. This process should be intuitive and user-friendly, requiring minimal effort from the students.
- **View Found Items:** The app should enable students to view a comprehensive list of found items uploaded by the administrators. This list should include detailed information about each item, such as its description, location found, and any other relevant details.
- **Search for Lost Items:** To facilitate easy identification of their lost belongings, students should have the ability to search for specific items within the list of found items.
- **Submit Claim Requests:** If a student identifies their lost item in the list, they should be able to submit a claim request. This request will initiate the verification process to ensure that the item is returned to its rightful owner.
- **Add Requests for Missing Items:** In cases where a student's lost item has not yet been recorded in the list of found items, they should have the option to add a request for their specific item. This request will prompt administrators to keep an eye out for the item and notify the student if it is found.

B. CU Admin App

This app is tailored for the administrative team at Chandigarh University and is designed to facilitate the management of lost and found items. Its functionalities should include:

- **Upload Found Items:** Administrators should have the ability to upload information about found items onto the app. This includes details like the item's description,

location found, and any other pertinent information.

- **Verify Claim Requests:** When a student submits a claim request for a specific item, the administrators should be able to verify the ownership of the item before facilitating its return. This process should be secure and efficient.
- **Communicate with Students:** The app should provide a communication platform for administrators to interact with students regarding lost and found items. This includes providing updates on claim requests and responding to inquiries.
- **Lost Item Submission:** This task involves setting up a physical submission process for lost items. This process should be well-organized and easily accessible to students. It should include clear instructions on how to submit an item, along with any necessary forms or documentation.

Administrator Functionality: Administrators play a crucial role in managing the lost and found process. They are

responsible for receiving, cataloguing, and verifying found items. The development of the CU Admin App will be central to this task, providing administrators with the necessary tools and features to efficiently carry out their responsibilities.

Student Functionality

The Student App should be designed with the user experience in mind. It should be intuitive, easy to navigate, and provide clear instructions on how to use its features. Additionally, the app should offer functionalities that empower students to take proactive steps in locating and claiming their lost items.

Item Request Submission

This task involves implementing a system within the Student App that allows students to add requests for their missing items. This feature is crucial for cases where a student's lost item has not yet been recorded in the list of found items.

By breaking down the development process into these specific tasks, the project team can focus on each aspect in detail, ensuring that both the Student and CU Admin Apps are built to meet the specific needs of their respective user groups.

III. RELATED WORK

A comprehensive review of existing solutions in the realm of lost and found systems reveals a spectrum of approaches employed by educational institutions and organizations to tackle this common challenge. These approaches have evolved over time, reflecting advancements in technology and changes in user expectations. Here, we explore the diverse landscape of existing solutions:

Web-Based Platforms: With the advent of the internet and digital databases, some institutions transitioned to web-based platforms for lost and found management.

These platforms allowed administrators to log found items electronically, making it easier to search for and retrieve information. Users could access these databases via a web portal, improving accessibility compared to traditional manual systems. However, these solutions often lacked the immediacy and convenience that modern mobile applications provide.

Mobile Applications: In recent years, mobile applications have gained prominence as effective tools for managing lost and found items. Many educational institutions and organizations have developed dedicated mobile apps to streamline the entire process. These mobile apps offer several advantages:

- **User-Friendly Interface:** Mobile apps provide a highly intuitive and user-friendly interface, making it easy for individuals to report lost items, search for found items, and initiate the item retrieval process.
- **Enhanced Accessibility:** Mobile apps are accessible to users at any time and from anywhere, reducing the need for physical visits to lost and found offices. This level of accessibility is particularly valuable for students and staff with busy schedules.
- **GPS and Image Recognition:** Some mobile apps leverage GPS technology to record the location where an item was found, enhancing the accuracy of item retrieval. Additionally, image recognition features enable users to match their lost items with found items through photographs.

Real-Time Updates: Mobile apps facilitate real-time communication between users and administrators. Users can receive updates on the status of their lost item claims and communicate with administrators, improving transparency and responsiveness.

IV. DESIGN FLOW/PROCESS



Figure 4.1 Data Flow Diagram

A. Evaluation & Selection of Specifications/Features

The journey of designing the Lost and Found app for Chandigarh University begins with a meticulous evaluation and selection of specifications and features. This phase is the bedrock upon which the entire project stands, requiring a comprehensive exploration of the necessary components. We collaborate closely with stakeholders, including students, administrative staff, and relevant university departments, to unearth the core functionalities and user expectations that are fundamental to the app's success.

- **Primary Objective:** The foremost objective of this phase is to meticulously define the foundational building blocks that will underpin the app's capabilities. By engaging with stakeholders, we gain invaluable insights into specific functionalities and features that will directly address the needs of the campus community. The ultimate aim is to enhance the efficiency, accessibility, and overall user experience.
- **Project Scope:** The scope of the project takes shape during this evaluation. It encompasses the critical functionalities and requirements essential for the app's success. Careful consideration of this scope ensures that the project maintains its focus and relevance, guarding against the potential pitfalls of feature bloat and scope expansion.
- **Resource Allocation:** The evaluation and selection process establishes a clear roadmap for resource allocation. This efficient allocation ensures that the project remains in alignment with its defined objectives and makes optimal use of available resources, including time, manpower, and technology.
- **User-Centric Design:** The phase strongly advocates for a user-centric design approach. Actively involving students, administrative staff, and other stakeholders deepens our understanding of their unique needs and preferences. This user-centric perspective directly informs feature selection, guaranteeing that the app will cater to the diverse requirements and expectations of its users.
- **Project Foundation:** The evaluation and selection of specifications and features form the bedrock upon which the project is built. This foundational phase is the compass that guides subsequent stages of design, implementation, and testing. It provides a robust framework for decision-making, ensuring that all project activities remain steadfastly aligned with the defined objectives.

B. Design Constraints

- **Technical Limitations:** The project operates within the bounds of existing technological capabilities. These constraints may include limitations in hardware, software, or network infrastructure. Recognizing and accommodating these limitations is essential to avoid unrealistic design choices.
- **Resource Availability:** The availability of resources, both in terms of personnel and technology, is a key constraint. The project must work within the confines of available resources, whether it's the expertise of the development team or the hardware and software tools

at their disposal.

- **Budget Considerations:** Budget constraints are a critical factor in the project's design. Staying within budgetary limits is crucial for financial sustainability. This constraint influences decisions related to software, hardware, and development processes.
- **Scalability and Flexibility:** The design must consider the potential for scalability and adaptability. The app should be capable of accommodating future growth, whether in terms of user base, data volume, or additional features.
- **Security and Privacy Regulations:** In today's digital landscape, security and privacy regulations are stringent. The app must adhere to these regulations, and any constraints related to security measures and privacy compliance must be incorporated into the design.
- **Compatibility and Interoperability:** The app may need to integrate with existing systems or external services. Compatibility and interoperability constraints ensure that the app can work seamlessly with other systems.

C. Analysis of Features and Finalization Subject to Constraints

- **Feasibility Assessment:** Each selected feature undergoes a thorough feasibility assessment. This includes evaluating whether the feature can be implemented within the existing technical and resource limitations. If a feature is found to be unfeasible, alternatives or adjustments are considered.
- **Resource Utilization:** Analysis delves into the resource utilization required for each feature. This encompasses considerations such as computing resources, memory, and personnel. It ensures that the project remains within resource limits.
- **Impact on Performance:** Each feature's impact on the overall app's performance is scrutinized. Features that may compromise the app's speed, responsiveness, or efficiency are carefully evaluated to determine whether they can be optimized or refined.
- **Alignment with User Needs:** Features are assessed to ensure they align with the needs and preferences of the app's users. This alignment is fundamental to providing an effective and user-centric solution.
- **Regulatory and Security Compliance:** The analysis incorporates a review of each feature's implications for regulatory compliance and security. Any features that may compromise data privacy or security are adjusted to ensure compliance.
- **Scalability Considerations:** The analysis also considers the scalability of features, ensuring that they are designed to facilitate seamless scaling as the user base and data volume expand over time.

D. Design Flow

- **Database Design:** The foundation of the design flow lies in the creation of an efficient database structure. This database will store information related to lost and found items, user profiles, and communication

logs. A well-designed database is critical for data integrity and efficient retrieval.

- **User Interface Development:** The phase dedicated

interface (UI) development concentrates on crafting an intuitive and visually pleasing interface for both the student and administrative versions of the application. Emphasizing ease of use, accessibility, and ensuring a uniform user experience are paramount considerations in the UI design process.

- **Backend Functionality:** The app's backend functionality is a core component of the design flow. This includes the development of features such as item submission, verification, notifications, and communication channels. The backend must be robust, secure, and capable of handling data efficiently.
- **Integration of Key Features:** The design flow encompasses the integration of key features, such as GPS location tracking, image recognition, real-time updates, and communication functionalities. These features are integrated into both the student and administrative versions of the app.
- **Testing and Quality Assurance:** The design process incorporates thorough testing and quality assurance procedures. This encompasses functionality testing, security testing, performance testing, and user acceptance testing. The testing protocols are in place to guarantee that the application operates as intended and adheres to established quality standards.
- **Iterative Refinement:** The design flow is not a linear process but rather an iterative one. Feedback and testing outcomes drive the continual improvement of the application's design and functionality. Through this iterative approach, the final product is tailored to align precisely with user expectations and project objectives.

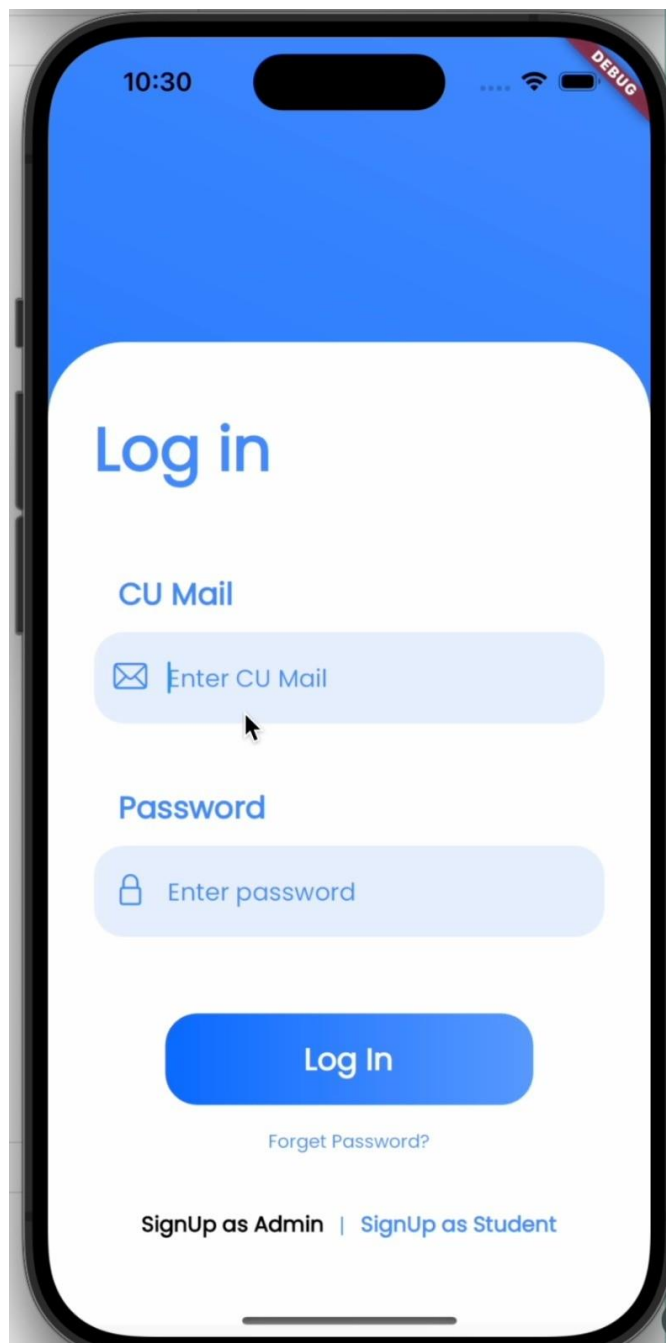
V. RESULTS ANALYSIS AND VALIDATION

The journey of implementing the solution is a pivotal chapter in the development of the Lost and Found app for Chandigarh University. This phase represents the culmination of meticulous planning, design, and decision-making, where the carefully crafted app begins its transformation into a functional reality. The implementation of the solution is a comprehensive process, encompassing a series of essential steps and activities.

- A. **Development:** The development phase is the crucible where the app's components come to life. This includes crafting the user interface, building robust backend functionality, and integrating essential features. Development is executed in alignment with the selected design, architecture, and technology stack.
- B. **Coding and Programming:** Seasoned developers harness their coding skills to bring the app's functionality to fruition. This entails writing code for both the front-end and back-end, ensuring the seamless and efficient operation of the app.

- C. Database Setup: The implementation also involves the setup and configuration of the app's database. This encompasses defining data structures, guaranteeing data integrity, and establishing mechanisms for the efficient retrieval and storage of data.
- D. User Interface Design: The user interface, the portal through which users interact with the app, is meticulously crafted. The design adheres to the established design principles and user experience guidelines. The user interface must be visually appealing, user-friendly, and consistent across both student and administrative versions of the app.

Figure 5.1: Login Page



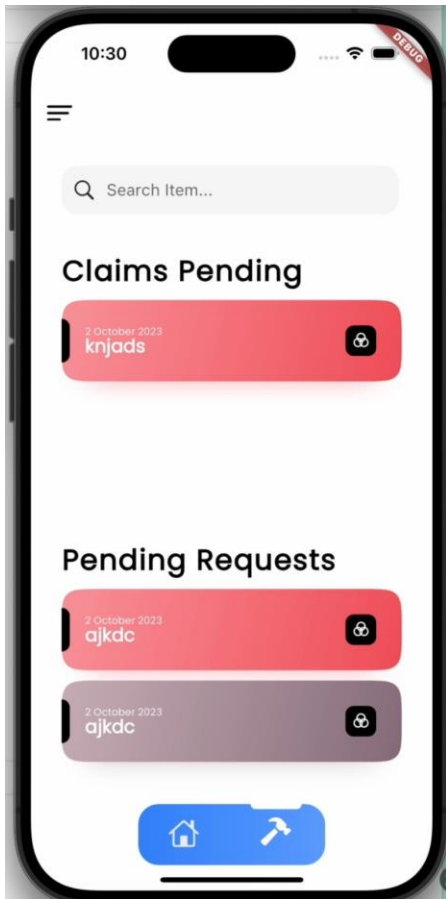


Figure 5.2: Lost Item clamming Page

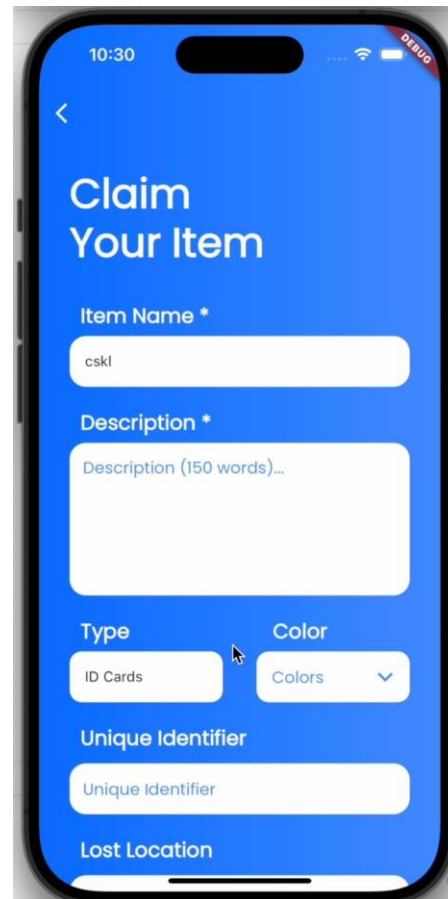


Figure 5.3: Claim your Item

CONCLUSION

In the quest to address the complex challenges associated with lost item management within the vibrant landscape of Chandigarh University, the development of the Lost and Found app stands as a testament to our unwavering commitment, collaborative spirit, and innovative problem-solving. This app represents not just a solution but a transformation in the way lost items are managed on the university campus. In this comprehensive conclusion, we reflect on the project's achievements and the profound impact it is poised to have on the university community.

A. Efficiency Enhancement: At the heart of this project lies the remarkable success in addressing the pressing need for efficiency in the management of lost items. Through meticulous planning and thoughtful design, the app streamlines the entire workflow. It provides real-time updates, and a user friendly interface, which significantly reduces delays and errors in the process. The result is a system that ensures lost items are returned

to their rightful owners with unprecedented swiftness.

B. Accessibility: The Lost and Found app is not just about efficiency; it's also about accessibility. It empowers students with the ability to effortlessly access information about found items, initiate the item retrieval process, and engage in seamless communication with administrative staff. This high degree of accessibility ensures that every member of the student body can benefit from the app's capabilities, regardless of their schedule or commitments.

C. Verification Streamlining: One of the project's remarkable achievements lies in the effective streamlining of the often-cumbersome verification process. This innovation reduces the need for multiple physical visits to the lost and found office, making the verification process more convenient for both students and administrative staff. It's a time and effort-saving transformation.

D. Improved Communication: The Lost and Found app has ushered in an era of improved communication between

students and administrators. Real-time updates, notifications, and inquiries ensure transparency and responsiveness throughout the lost item management process. This isn't just a technical improvement; it's a shift towards greater user empowerment and engagement.

The successful implementation of the Lost and Found app is more than a technical achievement; it's a profound transformation in the way lost items are managed at Chandigarh University. Students and administrative staff can now experience a more efficient, user-centric, and effective approach to handling lost items. The app's impact extends beyond mere convenience; it makes a substantial difference in the daily lives of the university community. While this chapter marks the conclusion of a significant phase in the app's development, the journey is far from over. Opportunities for future work and enhancement abound, paving the way for continuous improvement and innovation. As we look to the future, we remain committed to evolving the app to meet the changing needs of the university community.

VII. FUTURE ASPECTS

As we stand at the threshold of a new era in the management of lost items within the dynamic landscape of Chandigarh University, the development of the Lost and Found app signifies not just a destination but a starting point for future innovation. While we have achieved remarkable milestones, the road ahead is marked by numerous opportunities for continued work and enhancement that can further elevate the app's capabilities and impact.

Standing at the threshold of a new era in the management of lost items within the dynamic landscape of Chandigarh

University, the development of the Lost and Found app signifies not just a destination but a pivotal starting point for future innovation. In this transformative journey, key areas for future work emerge, demanding a comprehensive approach. These include a heightened emphasis on scalability to seamlessly accommodate the burgeoning user base and expanding database, a continuous integration of user feedback to ensure a user-centric evolution, fortified security measures to align with ever-evolving privacy regulations and guarantee the protection of user data, deeper integration with other campus systems to unlock new dimensions of functionality and convenience, and a robust embrace of enhanced user analytics to facilitate data-driven decision-making and maintain a finely attuned alignment with user preferences and needs. These focal points collectively serve as the cornerstone of the app's sustained performance, efficiency, and relevance, thereby solidifying its crucial position within the university ecosystem.

Positioned at the forefront of a groundbreaking shift, the Lost and Found app's development within Chandigarh University not only symbolizes a remarkable achievement but also embodies the catalyst for an era of unprecedented innovation. As we chart this transformative course, the

imperative for future progress spans a comprehensive spectrum, demanding unwavering commitment. Crucial aspects for ongoing development encompass an unwavering commitment to scalability, fostering an infrastructure capable of seamlessly accommodating the exponential growth of the user base and the escalating repository of lost and found items. Concurrently, an unyielding dedication to the continuous integration of user feedback, as the lifeblood of app refinement, remains pivotal, fostering an iterative process that allows for a nuanced and adaptive evolution in direct response to the dynamic needs and preferences of the user community. Reinforced security measures, undergirded by an unwavering commitment to compliance with evolving privacy protocols, are essential to fortify the app's resilience within an increasingly complex digital landscape, assuring users of the unwavering protection of their sensitive data. Furthermore, a strategic push towards deeper integration with diverse campus systems, including the student portal, campus security infrastructure, and administrative tools, stands as a testament to the app's pivotal role as a cohesive force within the university ecosystem, unlocking an unparalleled potential for convenience and functionality. Concomitantly, an enhanced focus on user analytics, leveraging data-driven insights to inform strategic decisions, serves as the cornerstone of the app's continual evolution, enabling it to remain finely attuned to the ever-evolving needs and preferences of its diverse user base. These collective pillars of progress serve to fortify the app's standing, perpetuating its indispensable relevance and resilience within the dynamic tapestry of Chandigarh University's technologically forward landscape.

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