Lost and Found

**Senior Design Team Contract**

University of Cincinnati

College of Education, Criminal Justice and Human Services

School of Information Technology

Drew Rawlins, Clay Nance, Adam Haywood, Neil Chopra, and Nate Virgin

Table of Contents

[Intent 3](#_Toc139472962)

[Senior Design Contract 4](#_Toc139472963)

[Project Summary 4](#_Toc139472964)

[Problem Statement 4](#_Toc139472965)

[Solution 4](#_Toc139472966)

[Contact Information 4](#_Toc139472967)

[Sponsor Information (if applicable) 5](#_Toc139472968)

[Project Source 5](#_Toc139472969)

[Project Objectives/Goals 5](#_Toc139472970)

[Team Members and Responsibilities 6](#_Toc139472971)

[Project Scope 7](#_Toc139472972)

[Quick Project Timeline 7](#_Toc139472973)

[Technologies Used 8](#_Toc139472974)

[Ethical Considerations 9](#_Toc139472975)

[Team Rules 9](#_Toc139472976)

[Team Signatures: 9](#_Toc139472977)

[References 11](#_Toc139472978)

# Intent

The following contract was written and agreed upon by Drew Rawlins, Clay Nance, Adam Haywood, Neil Chopra, and Nate Virgin. The contract provides expectations, objectives, and results for developing the Campus Lost and Found.

The contract is effective for all team members participating in the Senior Design Capstone class series in the 2025-2026 academic year.

# Senior Design Contract

## Project Summary

The UC Lost & Found application is a secure, streamlined platform for University of Cincinnati students and staff to report and recover any belongings lost on campus. Users can post descriptions of “lost” items and retrieve them by answering verification questions specific to the owner, while AI image analysis and metadata will be used to match lost and found reports accurately.

## Problem Statement

## The current Lost and Found system at the University of Cincinnati requires students and staff to submit forms and wait to be contacted if their items are found, with no publicly accessible database or photo listings of found items (University of Cincinnati, n.d.). This process is slow, fragmented, and often leaves users unsure if their belongings can be recovered. Research shows that centralized, searchable systems significantly improve lost item recovery rates and user satisfaction (Tan & Chong, 2023). To address these shortcomings, we propose a web-based Lost and Found application that allows users to submit detailed reports with photos, search for a live database of found items, and receive notifications when potential matches are identified. This solution will increase recovery rates, reduce frustration, and create a more efficient, user-friendly process for the campus community.

## Solution

## To address the limitations of the current system, we propose developing a web-based Lost and Found application for the University of Cincinnati that centralizes the reporting, tracking, and recovery of lost items. The platform will allow users to submit detailed item reports, including descriptions and photos, and search a live, searchable database of found items. Users will receive notifications when potential matches are identified, reducing the time and uncertainty involved in recovering lost belongings. Administrative features will enable staff to verify submitted items, manage reports, and maintain system integrity. By providing a transparent, user-friendly interface, our solution aims to increase recovery rates, improve user satisfaction, and streamline the Lost and Found process for the entire campus community.

## Contact Information

|  |  |  |  |
| --- | --- | --- | --- |
| Team Member | Degree + Track  Track N/A for BSCyber | Email | Phone Number OR Other Contact Info |
| Drew Rawlins | BSIT – Software Dev | rawlinaj@mail.uc.edu | 513-284-9876 |
| Clay Nance | BSIT- Networking/System Administration | [Nancecw@mail.uc.edu](mailto:Nancecw@mail.uc.edu) | 513-800-8132 |
| Adam Haywood | BSIT – Cybersecurity and Networking systems | [Haywooac@mail.uc.edu](mailto:Haywooac@mail.uc.edu) | 440-867-0481 |
| Nate Virgin | BSIT – Software Dev | [virginnr@mail.uc.edu](mailto:virginnr@mail.uc.edu) | 513-680-8218 |
| Neil Chopra | BSIT – Cybersecurity and Networking Systems | [chopranl@mail.uc.edu](mailto:chopranl@mail.uc.edu) | 419-705-1015 |

## Project Source

The idea for this project came from our team’s shared experience with the current campus Lost and Found process, which we found to be disorganized and unreliable. Students and staff often have no clear way to report or search for lost belongings, resulting in items going unclaimed or never being recovered. After informal conversations with classmates and faculty, we confirmed that this was a common frustration across campus. From these discussions, we recognized the need for a centralized, web-based solution that would make it easier to report lost items, upload identifying details such as photos, and search listings in a structured way. Our team formed with the goal of addressing this gap, bringing together diverse skills in software development, networking, and security to design and implement a practical solution that directly benefits our university community.

## Project Objectives/Goals

* **Develop a Centralized Lost & Found Platform**

We intend to develop an application that allows University of Cincinnati staff and students to be able to report and recover lost belongings on campus. The system will serve as a single, central location for reporting allowing item recovery to be more reliable, trustworthy, and intuitive within the UC community.

* **Implement Owner Verification**

To verify that lost items are returned to their rightful owner, the application will allow specific verification questions tied to the specific item. This prevents malicious actions such as theft while adding extra layers of security when recovering a(n) item.

* **Enhance Match Accuracy with Metadata and AI**

The application will utilize AI image analysis, and metadata (time, location, etc...) to accurately list and match lost and found reports. This will improve overall response efficiency and increase the chance of successful item returns.

* **Provide Secure Access via SSO**

Ensure that only UC-affiliated members have access to the Lost & Found application through UC single sign-on (SSO) integration. This makes sure that all users have authorized access to submit and view lost and found reports, implementing strong application and data security policies.

* **Ensure Accessibility and Usability**

The application will be developed with a user-friendly interface with the inclusion of accessible features to make sure it’s intuitive and easy to use by all users, including those who have disabilities or need extra assistance.

## Team Members and Responsibilities

Drew Rawlins – **Front End Development**

Front-end development is all about the creation of the user interface, which provides a smooth experience. Development in this area involves the building and maintenance of an application's visual elements. In that respect, front-end developers create layouts, interactive features, and responsive designs to work on various devices and browsers. They also collaborate very closely with back-end developers for smooth interaction and functionality across both teams. They also bring in web performance optimization, standards of accessibility, and deal with technologies like HTML, CSS, JavaScript, and frameworks such as React or Angular to present the application to the end user.

Clay Nance - **Data Handling, Back-end Development, Infrastructure Engineer**

Data Handling involves Database Administration and the safe collection, storage, processing, and presentation of application data. Back-end Development is mixed in with Data Handling and will ensure the backend logic and cloud-based architecture are integrated with the Front-end properly. Infrastructure Engineers will be responsible for proper provisioning and implementation of cloud-based resources, including (but not limited to) databases, VMs, storage, virtual networks, etc.

Neil Chopra - **Penetration Tester, Incident Responder, Infrastructure Engineer**

Penetration Tester, or Pen Tester, simulates cyberattacks to identify vulnerabilities in systems, networks, and applications. Incident Responder is tasked with managing and mitigating the impact of security incidents. Infrastructure Engineers will be responsible for proper provisioning and implementation of cloud-based resources, including (but not limited to) databases, VMs, storage, virtual networks, etc.

Adam Haywood - **Cloud Security Engineer and Security Analyst**

Cloud Security Engineer is responsible for securing cloud environments and ensuring that data and applications hosted in the cloud are protected from threats. Security Analysis plays a crucial role in protecting an organization’s computer systems and networks.

Nate Virgin – **Front and Back End Developer**

Front end focuses on the development of the structure of a user interface and the provision of smoothness in user experience. Back-end development concerns server logic, databases, and APIs, which support the front-end. Both work together in harmony to facilitate interaction between the UI and back-end systems smoothly. It is their duty to manage infrastructure comprising servers, databases, and cloud services by keeping everything running in an efficient manner, well-secured.

## Project Scope

Our team will develop a web-based Lost and Found application that addresses the inefficiencies of the current system on campus. The application will include the following features and capabilities:

* **User Registration and Authentication:** Users will be able to securely create accounts and log in.
* **Item Reporting:** Users can submit lost or found items with photos, descriptions, and categories (e.g., electronics, clothing, ID).
* **Search and Filter Functionality:** Users can search for items by keyword, category, location, or date.
* **Match Notifications:** The system will automatically notify users when an item they reported lost matches a found item.
* **Administrative Features:** Staff can verify reports, approve or reject submissions, and manage the database of items.
* **User Profiles:** Track users’ lost and found reports, including history and status updates.

**Out of Scope (for MVP):**

* Advanced AI matching (image recognition)
* Mobile app version (initial release will be web-based)
* Integration with external campus systems beyond Public Safety

This scope ensures a **minimum viable product (MVP)** is completed on time while still addressing the main pain points of the current Lost & Found process.

## Quick Project Timeline

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Task #* | *Task Name* | *Duration* | *Start Date* | *End Date* |
| *1* | *Project Research and Setup* | *4 weeks* | *August 18th 2025* | *September 22nd 2025* |
| *2* | *Backend/ API Configuration* | *8 weeks* | *September 23rd 2025* | *November 10th 2025* |
| *3* | *User and Penetration Testing* | *6 weeks* | *November 11th 2025* | *December 22nd 2025* |
| *4* | *Testing Review* | *2 weeks* | *December 23rd 2025* | *January 5th 2026* |
| *5* | *Debug* | *4 weeks* | *January 6th 2026* | *February 1st 2026* |
| *6* | *Deployment* | *4 weeks* | *February 2nd 2026* | *March 1st 2026* |
| *7* | *Documentation & Preparation* | *4 weeks* | *March 2nd 2026* | *March 30th 2026* |

## Technologies Used

*We will be using Visual Studio, Microsoft Teams, Microsoft Azure, GitHub, Postman, HTML, CSS, JavaScript, Node.JS, SQL, Tenable, Nmap, Wireshark, and Metasploit.*

Visual Studio – IDE being used for programming and scripting

Microsoft Teams – Application being used for communication purposes amongst teammates

Microsoft Azure – Cloud Computing Platform

GitHub – Storing and managing code, including commits and pull-requests

Postman – API builds and configurations

HTML – Structuring the website and its content.

CSS – Styles and formats the HTML elements.

JavaScript – Interacts with HTML and CSS elements. Performs functions based on interactivity. Requests for data are heard by Node.JS.

Node.JS - Node.JS receives requests for data from JavaScript. Node.JS interacts with SQL database server to retrieve data to present or manipulate on the front-end.

SQL – Stores, manages, and protects all resting application data. Receives Node.JS requests for data to use on the front-end.

Tenable – Tenable will be used as a vulnerability management tool to help scan, prioritize, and mitigate any threats to all systems being used.

Nmap – Nmap is a network discovery tool that can be used to help identify any hosts on the network, port scanning, as well verifying the status of a network

Wireshark – Wireshark is an open-source software that will be used to help analyze network traffic. Main uses of Wireshark will contain traffic analysis by capturing and analyzing packets that are sent and received.

Metasploit – This is a penetration testing tool that will be used to help identify and confirm if there are any vulnerabilities present within the application.

## Ethical Considerations

## There are several ethical considerations when developing the Lost and Found web application. It is critical for the system to be secure, fair, accessible, and transparent to ensure user trust and responsible use.

## **Privacy:** The application will handle personal information such as names, contact details, and item descriptions. All sensitive data will be encrypted both in transit and at rest, and access will be restricted to authorized staff (Albugmi, Alassafi, Walters, & Wills, 2016).

## **Transparency:** Users must understand how their data is used. Clear terms of service and informed consent forms will allow users to opt-in for notifications and data storage (Ioannidis, 2013).

## **Accessibility:** The platform will support screen readers, keyboard navigation, high-contrast visuals, and responsive design to ensure equitable access for all users (W3C, n.d.).

## **Fairness:** Automated notifications and search features will be applied consistently and without bias to ensure all users have equal opportunities to recover lost items (Mirghaderi, 2023).

## **Legal Compliance:** The system will comply with applicable privacy laws and institutional policies regarding data collection, storage, and usage (Barrett, 2019).

## Team Rules

1. Team members are expected to be respectful and actively listen to recommendations. Each team member has a valuable opinion and should always be taken into full consideration. Disagreements are inevitable but must be addressed courteously.
2. Team members are expected to actively participate in their portion of work. If a team member is struggling to complete any given task, the others must be available to assist. Each team member will be assigned a loose role but is also expected to help wherever needed.
3. Team members are expected to actively engage in discussions, either in person or virtually. Team members should also regularly check project progress and communicate in virtual chats.
4. Any team member that expects to be unable to participate in their tasks are expected to notify the rest of the team as soon as they are aware and how long they are expected to be absent.
5. Any alteration of the project’s configuration must be documented, or team members should be notified.
6. Team members should be available to answer questions or address concerns. Additionally, team members should ask questions or request assistance whenever necessary.

# **Team Signatures:**

Signature: Drew Rawlins Signature: Neil Chopra

Date: 9/22/2025 Date: 9/21/2025

Signature: Clay Nance Signature: Nate Virgin

Date: 9/21/2025 Date: 9/22/2025

Signature: Adam Haywood

Date: 9/22/2025

Advisor Signature: \_\_Tyler Hopperton\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_9/25/2025\_\_\_\_\_\_\_\_\_\_\_\_

# References

Albugmi, A., Alassafi, M. O., Walters, R., & Wills, G. (2016). Data security in cloud computing. 2016 Fifth International Conference on Future Generation Communication Technologies (FGCT), 55–59. https://ieeexplore.ieee.org/document/7605062

Al-Saadi, N. F. (2024). Combating algorithmic bias: Solutions to AI development to achieve social justice. Trends Research & Advisory. <https://trendsresearch.org/insight/combating-algorithmic-bias-solutions-to-ai-development-to-achieve-social-justice/>

Barrett, C. (2019). Are the EU GDPR and the California CCPA becoming the de facto global standards for data privacy and protection? Scitech Lawyer, 15(3), 24–29.

Ioannidis, J. P. A. (2013). Informed consent, big data, and the oxymoron of research that is not research. The American Journal of Bioethics, 13(4), 40–42. <https://doi.org/10.1080/15265161.2013.768864>

Mirghaderi, L. (2023). Ethics and transparency issues in digital platforms. MDPI. https://www.mdpi.com/2673-2688/4/4/42

Tan, S. Y., & Chong, C. R. (2023). An effective lost and found system in university campus. Journal of Information System and Technology Management, 8(32), 99–112. [https://www.researchgate.net/publication/374608419\_AN\_EFFECTIVE\_LOST\_AND\_FOUND\_SYSTEM\_IN\_UNIVERSITY\_CAMPUS](https://www.researchgate.net/publication/374608419_AN_EFFECTIVE_LOST_AND_FOUND_SYSTEM_IN_UNIVERSITY_CAMPUS?utm_source=chatgpt.com)

University of Cincinnati. (n.d.). Lost & Found. University of Cincinnati Public Safety. Retrieved September 21, 2025, from [https://www.uc.edu/about/publicsafety/services/lost-found.html](https://www.uc.edu/about/publicsafety/services/lost-found.html?utm_source=chatgpt.com)

W3C Web Accessibility Initiative. (n.d.). Introduction to web accessibility. World Wide Web Consortium. <https://www.w3.org/WAI/fundamentals/accessibility-intro/>