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TrackIt – A Lost & Found System

1. Introduction

1.1 Background:

Losing personal belongings like textbooks, notebooks, and ID cards is a common issue in environments such as universities and libraries. These items are not only valuable but often contain essential study materials, and losing them can significantly impact students' academic and emotional well-being. Traditionally, lost and found processes rely on physical notice boards, which can be inefficient and limited in reach. The "TrackIt – A Lost & Found System" project aims to address this gap by providing a user-friendly web application that helps students efficiently report and recover lost items, ensuring a more streamlined and effective solution for campus settings.

1.2 Objective:

The primary goal of TrackIt is to create a web-based platform that simplifies reporting and finding lost items, especially those valuable to students. Users can post details like descriptions, locations, and photos of lost or found items. The platform will feature search capabilities to help locate items based on various criteria, enhancing the chances of recovering important belongings such as academic materials and personal electronics. By streamlining communication between owners and finders, TrackIt aims to ensure lost items are returned promptly and securely.

2. Problem Statement

2.1 Problem Description:

Currently, there is no centralized system for reporting and tracking lost and found items, leading to inefficiencies in recovering lost belongings. Individuals often rely on social media or physical notice boards, which are not always effective or accessible. There is a need for a digital solution that allows users to report lost items and connect with those who have found them.

2.2 Importance of the Problem:

The absence of an organized system for managing lost and found items results in frustration and lost time for individuals. A digital platform like TrackIt can significantly reduce the time and effort required to locate lost items, providing a more structured and accessible way to report and find belongings.

3. Study of the Existing System

3.1 Overview of the Existing System:

The existing systems for managing lost and found items are generally informal and fragmented. Typically, individuals report lost items through social media platforms like Facebook groups, WhatsApp, or physical notice boards at institutions. Some places have dedicated lost and found desks, but these are not integrated into a wider system, making it difficult for people to search for their belongings across different locations.

3.2 Limitations of the Existing System:

Lack of Centralization: Existing systems are decentralized, making it hard for users to search for items across multiple platforms.

No User Authentication: Most existing systems do not require user authentication, leading to potential misuse and lack of accountability.

Limited Accessibility: Physical notice boards or lost and found desks are only accessible during specific hours and at particular locations, which may not be convenient for everyone.

Inefficient Communication: The communication between the finder and the owner is often delayed or non-existent due to the lack of a structured reporting system.

3.3 Comparative Analysis:

The existing system without user signup and login lacks the security and privacy needed to ensure that only legitimate users are interacting on the platform. TrackIt will introduce user authentication, which will not only secure the platform but also provide a way to verify the identity of users before they can post or respond to a lost/found item. This feature will improve the

reliability and trustworthiness of the platform, fostering a safer and more organized community where users can confidently connect and recover their valuable belongings.

4. Proposed Solution

4.1 Overview:

"TrackIt – A Lost & Found System" is a web app designed to streamline the process of reporting, tracking, and recovering lost items. Unlike the existing manual or disorganized systems, TrackIt offers a centralized, user-friendly platform powered by modern technologies like React, Express, Node.js, and MongoDB for efficient and secure data management.

4.2 Key Features:

- **User Authentication**: Secure login and profiles for managing reports.
- **Item Reporting**: Easy submission of lost/found items with details and photos.
- **Claim Management**: Structured, secure claim process.
- **Admin Dashboard**: Tools for overseeing and managing the platform.

4.3 Innovation:

TrackIt improves upon traditional systems by offering real-time data synchronization, an intuitive user experience, and secure, efficient workflows, making it a more effective and trustworthy solution.

5. Scope of the Project

5.1 Inclusions:

- User registration and authentication module.
- Posting and searching functionalities for lost and found items.
- Communication tools for users to connect securely.
- Administrative tools for managing user accounts and posts.

5.2 Exclusions:

- The project will not include the development of a mobile application, focusing solely on the web platform.
- It will not cover any offline lost and found services or physical infrastructure.
- A real-time chat feature between the users for communication will not be available.

6. Preliminary System Design

6.1 High-Level Architecture:

The architecture of "TrackIt – A Lost & Found System" is based on a modern, three-tiered client-server model, consisting of the following layers:

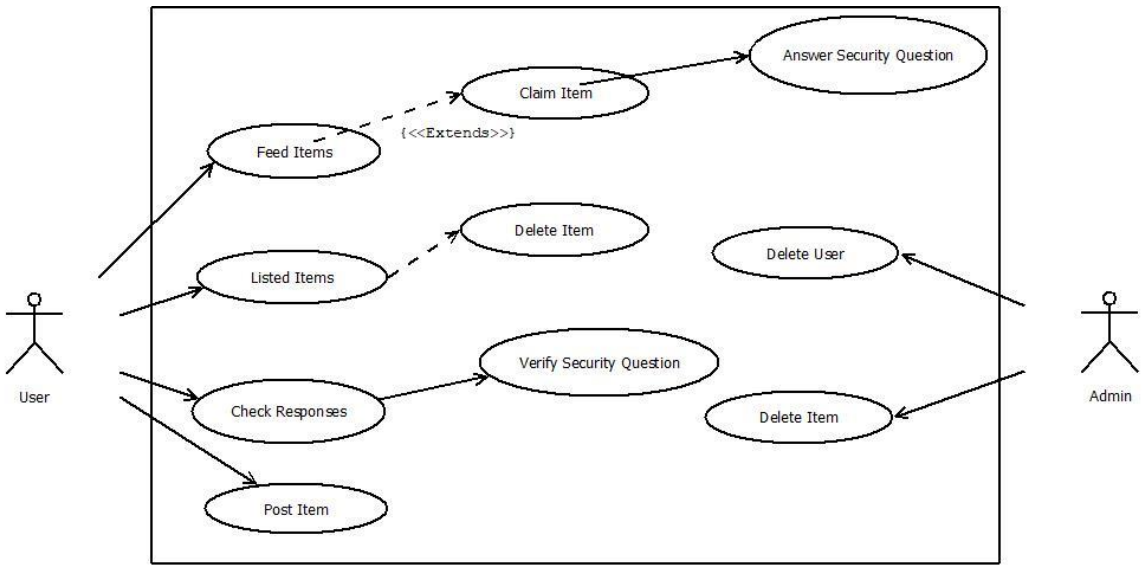

Fig 1: Use Case Diagram

- **Client (Frontend)**: React.js
- **Server (Backend)**: Node.js with Express.js
- **Database**: MongoDB
- **Authentication**: JWT (JSON Web Tokens)

6.2 Major Components:

- **User Interface (UI):** The UI will be designed with simplicity and usability in mind, featuring forms for posting lost and found items, search filters, and user profiles. The design will prioritize accessibility, ensuring that all users, including those with disabilities, can navigate the platform effectively.
- **API Layer:** The API layer, built with Express.js, will serve as the intermediary between the frontend and the database. It will handle all HTTP requests, processing data, and returning responses in JSON format. Key functionalities such as item posting, searching, user registration, and messaging will be exposed through well-defined API endpoints.
- **Database Layer:** MongoDB will store and manage all data related to users, items, and interactions. The database schema will be designed to support rapid querying and data aggregation, allowing users to quickly find relevant items or track their lost belongings.
- **Authentication and Authorization:** JWT-based authentication will manage user sessions and secure access to different parts of the application. User roles (e.g., admin, regular user) will be defined, with appropriate access controls to ensure that only authorized actions can be performed by different users.

6.3 Data Flow:

- **User Actions**: Users sign up, log in, or report lost/found items via the React frontend.
- **Request Handling**: The frontend sends HTTP requests to the Express backend using Axios.
- **Backend Processing**: The backend authenticates users, interacts with MongoDB for data storage/retrieval, and returns responses.
- **Data Rendering**: The frontend displays the retrieved data (e.g., item listings) to the user.
- **Updates**: The system can notify users of matching items in real-time.

7. Feasibility Analysis

7.1 Technical Feasibility:

Given the current technology stack (React, Node.js, Express, and MongoDB), it is feasible to implement TrackIt. The tools and technologies chosen are well-supported and widely used, ensuring the project's technical success.

7.2 Economic Feasibility:

The project is cost-effective as it utilizes open-source technologies, minimizing development costs.

7.3 Operational Feasibility:

TrackIt is designed to be user-friendly, with a simple and intuitive interface. The platform's success will depend on user adoption, but its functionality aligns with the needs of potential users, making it operationally feasible.

8. Tools and Technologies

8.1 Programming Languages:

- **Frontend:** JavaScript (React.js)
- **Backend:** JavaScript (Node.js, Express)

8.2 Development Tools:

- **Code Editor:** Visual Studio Code
- **Version Control:** Git and GitHub
- **API Testing:** Postman

8.3 Database:

- MongoDB: For storing user data, item details, and other application data.

9. Expected Outcomes

9.1 Deliverables:

A fully functional web application with a user-friendly interface. Documentation covering the system design and development process.

9.2 Success Criteria:

The system should successfully allow users to register, post, and search for lost and found items. User authentication should be secure and efficient.

10. Risks and Challenges

10.1 Potential Risks:

Security Risks**:** There is a risk of data breaches if the authentication system is not implemented correctly.

10.2 Mitigation Strategies:

Security Measures**:** Implement robust security practices, including encryption and regular security audits.

11. References

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