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"YouR Code: Recovering Lost Items"

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Abstract-The increasing frequency of lost personal items presents a need for efficient recovery solutions. This research explores a system using QR codes and the Geolocation API to streamline the return of lost items. By scanning a QR code attached to a lost item, a finder can instantly share their location with the owner. The proposed system automates location sharing, ensures privacy through user consent, and provides a simple, effective means of item recovery. This study assesses the system's technical performance, user experience, and privacy considerations.

Keywords- QR code, Lost item recovery, Geolocation API, Location tracking, User consent, Item return system, Real-time location sharing

I.INTRODUCTION

The loss of personal belongings is a common occurrence, whether it be wallets, keys, or mobile phones. Traditional methods of item recovery, such as lost and found stations or manual searching, are often inefficient and unreliable. With the rapid advancement of digital technologies, particularly smartphones and web-based services, new opportunities have emerged to streamline the process of item recovery. QR (Quick Response) codes, which are increasingly ubiquitous in various industries, offer a potential solution by enabling direct interaction between the finder of a lost item and the item's owner.

This paper proposes a system where personal items are labeled with QR codes linked to a web-based platform that utilizes the Geolocation API. When a QR code is scanned by the finder, the system automatically captures the finder's location and transmits it to the item's owner, facilitating easy communication between the two parties. The use of the HTML5 Geolocation API allows the system to retrieve the geographical coordinates of the scanned location, providing precise information on where the item was found. This method not only simplifies the process of returning lost items but also minimizes the effort required by both the finder and the owner.

Furthermore, the system addresses critical concerns regarding user privacy and data protection by implementing consent mechanisms and secure data transmission protocols. The proposed solution highlights the potential of combining widely available technologies to solve everyday problems efficiently. In this paper, we explore the technical implementation of the system, examine its real-world applications, and discuss the potential challenges and limitations, including user adoption and privacy concerns.

By integrating modern web technologies, this approach offers a practical and innovative solution to item recovery, improving outcomes for both finders and owners of lost belongings.

II. LITERATURE SURVEY

The integration of QR codes and geolocation for item recovery has gained attention due to its practicality and ease of implementation. Studies have explored QR codes for item identification, linking them to systems where finders can report lost items. QR codes are preferred due to their simplicity and wide accessibility. Research indicates that QR codes are increasingly used in systems for labeling and recovering lost items. These codes contain information that can be scanned by a mobile device, directing the finder to a web-based platform that manages the recovery process.

The use of geolocation APIs in conjunction with QR codes enhances the effectiveness of item recovery systems. Several studies discuss the application of the HTML5 Geolocation API to capture the finder's exact location, thus enabling the owner to know precisely where the item was found. These studies emphasize the importance of accurate location tracking to facilitate faster and more successful recovery. Privacy issues are a key consideration when implementing geolocation services.

Previous research stresses that user consent must be obtained before capturing any location data. Measures such as data encryption and secure transmission are necessary to ensure that sensitive information, including geolocation data, is protected. Failure to address privacy concerns may hinder user adoption of such technologies. Many existing item recovery systems using QR codes and geolocation APIs integrate more complex mechanisms, including third-party databases and public lost-and-found services. These systems tend to involve intermediary platforms that manage the recovery process, while simpler systems focus on direct communication between the finder and the item's owner. Studies have shown that user-friendly interfaces and direct communication channels improve the chances of successful recovery.

In summary, the literature reveals that QR code and geolocation technologies have been widely explored for item recovery. However the proposed system, which emphasizes simplicity and direct user interaction, represents a practical alternative to more complex, database-driven recovery solutions. The combination of privacy protections and real-time geolocation tracking makes the approach a valuable addition to this field.

III. METHODOLOGY

The system comprises three components: QR code generation, geolocation tracking, and a backend server. Unique QR codes are generated for each item, linking to a web platform where finders can report the item's location. The HTML5 Geolocation API is employed to capture the finder's location, which is transmitted to the backend for storage and notification. The frontend, built with HTML, CSS, and JavaScript enables users to scan QR code and grant location permissions. Geolocation data is captured through the API and sent to a backend server, developed using google script editor for storage and notification. Finders scan the QR code and, upon consent, share their geolocation. The system transmits the coordinates to the item owner via email.

User consent is obtained before capturing location data and all transmissions are encrypted to ensure data security. Geolocation accuracy, response times, and user satisfaction are evaluated. Privacy concerns are addressed by incorporating user consent mechanisms and secure data storage practices.

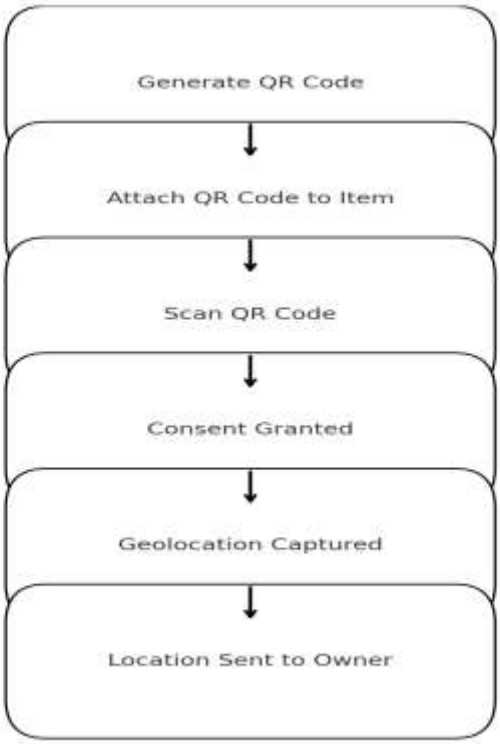

Figure 3.1

IV. LIMITATIONS

Firstly, the reliance on user consent for location sharing can impact the accuracy and effectiveness of the recovery process. If a finder chooses not to share their location, the owner may receive no information, leading to frustration. Additionally, the system requires an internet connection for QR code scanning and geolocation reporting, which can hinder functionality in remote or low-connectivity area.

Another significant limitation is the potential for damage to the QR code itself. If a code becomes scratched, worn, or otherwise illegible, it can render the entire recovery process ineffective. Furthermore, the risk of miscommunication between the finder and the owner can lead to confusion about the item's location or the circumstances of its recovery. If the finder misinterprets the situation or fails to provide clear information, the owner may struggle to locate their item accurately.

The system also faces security concerns, as it could potentially be exploited by thieves. If someone finds a valuable item and scans the QR code, they could misuse the information to locate the owner and engage in dishonest behavior. Lastly, the geolocation capabilities may not always provide exact coordinates, especially in urban environments where signal interference can distort accuracy. These limitations highlight the challenges that must be addressed for the system to function effectively and be widely adopted.

V. FUTURE SCOPE

5.1 Enhanced Security Measures: Implementing advanced encryption and data anonymization can further ensure user privacy.

5.2 Integration with IoT Devices: The system could be extended to interact with smart home devices for automated item tracking.

5.3 Mobile Application: Developing a dedicated app could streamline user interaction and provide offline QR code scanning.

5.4 Broader Item Recovery Network: Expanding the system to include partnerships with public authorities, businesses, or lost-and-found services would enhance its reach and usability.

VI. CONCLUSION

In conclusion, the proposed QR code-based lost item recovery system offers an efficient and user-friendly solution for returning lost items to their rightful owners. By integrating QR codes with geolocation technology, the system allows finders to easily scan an item and share their location with the owner. While the system faces limitations such as dependence on internet connectivity, potential QR code damage, and privacy concerns, future improvements in security, usability, and partnerships with organizations can make the system more robust and widely applicable. The simplicity of the system ensures broad applicability and ease of use.

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