Aankh : A Police Accountability System with Node.js

***Abstract*—This research paper introduces "Aankh" a law enforcement accountability system developed using Node.js, React.js, and Flutter technologies. Aankh emerged as the winner in the Azadi Ka Amrit Mahotsav Hackathon in the EBIT (Electronics and Biomedical Engineering) category. The project aims to address challenges related to lower-ranking police officers missing security checkpoints during their patrols. The system incorporates real-time GPS tracking via Flutter for mobile applications and leverages Node.js and React.js for backend and web interface development, respectively. The integration of these technologies facilitates a comprehensive solution for optimizing law enforcement accountability.**

***Index Terms*—Node.js, React.js, Flutter, Law enforcement, Accountability, GPS tracking, Mobile application, Backend development, Web interface.**

I. Introduction

Law enforcement agencies face the ongoing challenge of ensuring officers adhere to their security routes and do not omit critical checkpoints. This research introduces a mobile application designed to enhance accountability within law enforcement agencies, leveraging the power of Node.js, React.js, and Flutter for robust functionality and user-friendly interfaces.

A. Problem Statement

The manual monitoring of officers' security routes often proves insufficient, leading to potential lapses in public safety. Lower-ranking officers may skip or miss checkpoints, jeopardizing the security of specific areas. This project addresses this issue by employing a technologically advanced system that utilizes GPS tracking and seamless communication between officers and higher-ranking personnel.

II. Technology Stack

The chosen technology stack comprises Node.js for backend development, React.js for the web interface, and Flutter for mobile application development. This combination ensures scalability, efficiency, and cross-platform compatibility.

III. System Architecture

A. Node.js Backend

The Node.js backend serves as the central hub for data processing and communication. It handles real-time updates from mobile applications, processes emergency checkpoint changes initiated by higher-ranking officers, and ensures smooth communication between the mobile and web components. It uses mongoDB(noSQL) as primary database and also uses Express on top of node.js

B. React.js Web Interface

The React.js web interface provides a secure and user-friendly platform for higher-ranking officers to monitor officers' activities, manage checkpoints, and respond to emergencies. It facilitates seamless integration with the Node.js backend for efficient data exchange.

C. Flutter Mobile Application

The Flutter mobile application offers GPS-based real-time tracking of officers' locations. It notifies officers of upcoming checkpoints and alerts higher-ranking officers in case of deviations.

IV. Implementation

The development process involves coding for the Node.js backend, React.js web interface, and Flutter mobile application. Integrating these technologies requires careful consideration of data flow and Storing and Retriving data from database(mongodb) and security protocols to ensure a seamless user experience.

V. Results and Discussion

Preliminary testing has demonstrated the effectiveness of the system in reducing instances of officers deviating from their assigned routes. The technology stack's synergy contributes to a responsive, scalable, and user-friendly solution for law enforcement accountability.

VI. Conclusion

The integration of Node.js, React.js, and Flutter has proven to be a powerful combination for developing a comprehensive Police Tracking system. The project's success lies in the coordination between the backend, web interface, and mobile application, providing a robust solution to address security checkpoint challenges.

VII. Future Work

Future work will involve using AI and ML to use Face Recognition technology for extra verification of the availability of officers ans also includes refining the system based on user feedback.

References