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Track My Device With Ai Assistant System

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Abstract: *The increasing reliance on mobile devices such as smartphones, tablets, and laptops has intensified concerns regarding device security, tracking, and recovery. The loss of a mobile device may result in serious consequences, including data exposure, financial loss, interruption of communication, and violation of privacy. Although existing tracking and security solutions provide certain levels of protection, many of them are limited by weak predictive capability, fragmented functionality, and inadequate support for critical events such as SIM card replacement, device shutdown, unauthorized movement, and low battery conditions. Consequently, there is a need for an intelligent and integrated device tracking system capable of offering effective monitoring and recovery support. This review paper examines existing device tracking and security systems with the aim of identifying key research trends, limitations, and gaps that affect their usability and effectiveness. The review focuses on challenges related to poor performance in low-connectivity environments, limited real-time intelligence, lack of conversational interaction, insufficient multi-device management, and weak integration of anti-theft mechanisms. Based on these observations, the study motivates the development of a Track My Device with AI Assistant system that integrates real-time GPS tracking, machine learning-based movement prediction, geofencing alerts, SIM change notifications, remote lock, alarm activation, low battery alerts, and an AI chatbot within a unified platform. The proposed system is intended to strengthen device security, improve recovery prospects, support real-time monitoring, and provide users with a practical and intelligent means of managing multiple devices.*

Keywords — Device Tracking, Artificial Intelligence, GPS Technology, Machine Learning, Geofencing, Anti-Theft Systems, Remote Locking, Alarm Activation, Multi-Device Management.

1.0 INTRODUCTION

The increasing reliance on mobile devices such as smartphones, tablets, and laptops has made device security, tracking, and recovery an important issue in contemporary digital environments. These devices store personal, financial, and professional information, and their loss can result in privacy breaches, financial damage, and disruption of daily activities[1]. Although several tracking and security applications are available, many of them provide only limited functionality, weak predictive support, and inadequate protection against common theft-related events such as device shutdown, SIM card replacement, and unauthorized movement. As a result, there is a growing need for an intelligent and integrated system that can support effective monitoring and recovery of lost or stolen devices[2].

Recent advances in artificial intelligence, machine learning, GPS technology, and data-driven decision-support systems offer new opportunities to improve device tracking and security[3]. These technologies make it possible to develop systems that can monitor device location in real time, analyze movement patterns, predict likely future positions, and generate timely alerts when suspicious events occur[4]. In addition, conversational AI and interactive dashboards can enhance user experience by making system control simpler and more accessible. This project therefore focuses on the development of a Track My Device with AI Assistant system that integrates real-time GPS tracking, movement prediction, geofencing alerts, anti-theft mechanisms, and multi-device management into a single user-friendly platform to improve device security and recovery[5].

1.1 BACKGROUND OF THE STUDY

The increasing dependence on mobile devices such as smartphones, tablets, laptops, and all android devices has created a growing need for effective device tracking and security solutions. These devices are now essential for communication, education, business, and personal organization, and their loss can lead to serious consequences including financial damage, data exposure, interruption of communication, and privacy violations[6]. As the use of digital devices continues to expand, so too does the risk of misplacement, theft, and unauthorized access. Although several tracking and security applications exist, many of them provide only limited functionality, weak predictive capability, and insufficient support for critical events such as SIM card changes, device shutdown, low battery conditions, and unauthorized movement. This has created a strong need for a more intelligent and integrated system that can assist users in monitoring and recovering their devices effectively[7].

The problem of device loss is particularly significant because modern devices store large amounts of sensitive personal, academic, and professional information[8]. When a device is lost or stolen, the user may face not only the cost of replacement but also the risk of losing valuable data and access to important services. In many cases, conventional tracking methods are unable to provide timely alerts or

accurate location updates, especially when network connectivity is weak or when the device is intentionally turned off. This limitation reduces the chances of successful recovery and exposes users to greater security risks. As a result, there is a need for a smarter approach that combines real-time monitoring, predictive analysis, and automated security responses within a single platform[9].

Recent developments in artificial intelligence, machine learning, GPS technology, and data-driven monitoring systems have created new opportunities for improving device tracking and protection. These technologies make it possible to design systems that can analyze movement patterns, estimate possible future locations, and generate intelligent alerts when suspicious behavior is detected. For example, GPS-based tracking can provide real-time location information, while machine learning models can use historical movement data to predict where a device is likely to move next[10]. In addition, intelligent alert systems can notify users when the device leaves a defined area, when the SIM card is changed, or when the power is switched off. Such capabilities are especially important in environments where users require immediate and reliable information about the status of their devices[11].

The integration of AI assistants into tracking systems has further expanded the potential for user-friendly and interactive device management. An AI chatbot can allow users to communicate with the system through conversational queries, making it easier to request location updates, device status reports, or security actions such as remote locking and alarm activation. This type of interaction reduces the complexity of using the system and makes it more accessible to a wide range of users, including those with limited technical knowledge[12]. In addition, the inclusion of a dashboard for multi-device management enables users to monitor several devices at the same time, displaying important information such as current location, battery level, and security status in a clear and organized manner[13].

Another important factor supporting the development of this system is the increasing need for anti-theft protection in both personal and organizational settings. Many individuals and institutions rely on multiple connected devices for daily operations, and losing one device can disrupt communication, work, and access to information[14]. A system that combines remote lock, alarm activation, geofencing alerts, and SIM change notifications can significantly improve the chances of recovering a lost device while also discouraging unauthorized use. These functions are especially valuable in cases where the device is moved out of a safe area or when suspicious actions occur. By automatically detecting such events, the system can respond faster than traditional manual methods of tracking and recovery[15].

The proposed Track My Device with AI Assistant system is therefore motivated by the need to bridge the gap between basic tracking applications and a more intelligent, integrated, and responsive solution. A well-designed system should not only identify the current location of a device but also analyze movement history, support predictive tracking, and provide immediate alerts in response to security threats. It should also offer a simple and accessible interface through which users can interact naturally with the system, manage multiple devices, and receive clear status updates. By combining artificial intelligence, machine learning, GPS tracking, geofencing, and automated anti-theft functions, the system seeks to improve device security, enhance recovery outcomes, and provide users with a practical tool for real-time monitoring and control.

The development of such a system is timely because device-related security concerns continue to increase alongside the rapid expansion of digital technology. As individuals become more dependent on mobile devices for communication, storage, and access to services, the consequences of device loss become more severe. An intelligent device tracking system can help reduce these risks by offering continuous monitoring, timely alerts, and predictive support. In this way, the proposed project aligns with the broader goal of using modern technology to solve everyday problems in a more effective and user-centered manner.

1.2 PROBLEM STATEMENT

Despite the increasing reliance on mobile devices for communication, work, education, and personal information storage, many users continue to experience difficulties in locating and recovering lost or stolen devices. Current tracking solutions often provide only basic location services and are limited in their ability to deliver real-time monitoring, predictive tracking, and timely security responses. In addition, several existing systems do not adequately address critical events such as SIM card replacement, device shutdown, unauthorized movement, low battery conditions, and remote security control. As a result, users are often left with fragmented tools that fail to provide comprehensive protection and effective recovery support. The absence of an integrated and intelligent device tracking platform has made it difficult for users to monitor multiple devices conveniently and respond quickly when suspicious activity occurs. Many available applications require users to switch between different tools to access location updates, security alerts, and device status information, which reduces efficiency and increases the chance of delayed action. Furthermore, the lack of an AI-based conversational interface limits usability for individuals who may not be technically skilled. Therefore, there is a clear need for a Track My Device with AI Assistant system that combines real-time GPS tracking, movement prediction, geofencing alerts, anti-theft features, and multi-device management within a single user-friendly platform. Such a system would improve device security, increase recovery chances, and provide users with a more intelligent and convenient way to manage their devices.

1.3 OBJECTIVES

1.3.1 Main Objective

To design and develop an AI-powered smart device tracking system that enables real-time location monitoring, intelligent

prediction of device movement, secure alert mechanisms, and interactive user engagement through a chatbot interface

1.3.2 Specific Objectives

1. To develop a real-time device tracking system using GPS technology that ensures accurate location monitoring even in areas with weak network connectivity.

2 To design an AI-powered monitoring system that analyzes device movement history and uses machine learning techniques to predict the possible future location of the device.

3 To implement an intelligent alert and security system that notifies users when the device leaves a defined geographical area, when the SIM card is changed, when the device is turned off, or when the battery level is low, while also providing anti-theft features such as remote lock and alarm, and integrating an AI chatbot for conversational interaction.

4 To create a user-friendly multi-device management system that allows users to monitor multiple devices through an interactive dashboard displaying location, status, and battery information.

2.0 Related Works

2.1 AI-Driven Device Tracking and Recovery Systems

Recent studies have explored the use of artificial intelligence in device tracking and recovery, showing that intelligent models can improve the ability to locate lost or stolen devices more efficiently[16]. These systems generally combine GPS-based positioning with machine learning techniques to identify location patterns, detect unusual movement, and support faster recovery actions. The findings indicate that AI can enhance traditional tracking methods by providing predictive capabilities rather than relying only on current location information. In addition, some studies highlight the importance of designing user-friendly interfaces so that non-technical users can easily access device status, alerts, and recovery options[17]. This is relevant to the proposed Track My Device with AI Assistant system because it demonstrates the value of integrating intelligent prediction and simple interaction into a single tracking platform[18].

2.2 GPS-Based Real-Time Device Monitoring

Other studies have focused on GPS-enabled real-time monitoring systems for mobile and portable devices. These systems continuously capture location data and transmit it to a central dashboard where users can observe the live movement and status of their devices[19]. Research shows that real-time monitoring is useful for improving awareness, increasing recovery chances, and responding quickly when a device is misplaced or stolen[20]. However, many of these systems depend heavily on stable network connectivity and may perform poorly in weak signal environments. This limitation directly supports the need for a more resilient tracking system that can still provide useful monitoring even when connectivity is unstable. For the proposed project, this evidence justifies the inclusion of real-time GPS tracking with support for low-connectivity conditions[21].

2.3 Intelligent Alert and Anti-Theft Mechanisms

A number of related works have examined automated alert systems designed to protect devices from unauthorized access and theft[22]. These studies show that features such as geofencing, SIM card change notifications, battery alerts, remote locking, and alarm activation can significantly improve device security[23]. When a device leaves a predefined area or exhibits suspicious behavior, the system can immediately notify the user and initiate protective actions. The literature also suggests that such alerts are most effective when delivered in real time and combined with simple response tools. This supports the proposed system's focus on intelligent alerts and anti-theft functions, since these features strengthen prevention, detection, and recovery within one integrated environment[24].

2.4 Machine Learning for Movement Prediction

Several studies have investigated the use of machine learning to analyze movement history and predict future location patterns. These approaches are based on the idea that devices often follow recurring movement behavior depending on user routines, transport patterns, or location history[25]. By learning from previous data, predictive models can estimate where a device is likely to move next, which may improve recovery efforts and provide early warning in suspicious situations. However, the literature also notes that prediction accuracy depends on the quality and amount of historical data available. This is important for the proposed project because movement prediction is one of its core objectives, and it shows that AI can add value beyond simple tracking by supporting proactive decision-making[26].

2.5 AI Chatbots and User Interaction

Recent research has also explored conversational AI as a means of improving system accessibility and user experience. AI chatbots allow users to ask questions, request status updates, and trigger actions through natural language rather than navigating complex menus. This interaction style is especially useful for users who may not be technically skilled or who need fast access to information during emergencies[27]. Studies indicate that conversational interfaces can make digital systems more intuitive, responsive, and user-centered. This is directly related to the proposed Track My Device with AI Assistant system because the chatbot feature is intended to simplify communication between the user and the tracking platform while improving convenience and ease of use[28].

2.6 Multi-Device Management Dashboards

Other related works have examined dashboards for managing multiple connected devices from a single interface[29]. These

systems present important information such as device location, battery level, connectivity status, and security alerts in an organized and accessible format. Research shows that dashboard-based management improves monitoring efficiency, especially for users who need to track several devices at the same time[30]. At the same time, the literature suggests that many existing platforms do not provide enough integration between status monitoring, alerts, and control functions. This supports the proposed project's aim of creating a user-friendly multi-device management dashboard that brings together all essential information in one place[31].

3.0 OBSERVATIONS

Synthesizing the reviewed literature on device tracking technologies reveals several key observations regarding existing research trends, limitations, and gaps.

Fragmentation of Device Tracking Solutions
A common observation across the reviewed literature is that many device tracking technologies are developed as standalone solutions that address only specific functions such as location monitoring, alarm activation, or remote locking[32]. Very few systems provide a complete framework that integrates real-time tracking, predictive analysis, intelligent alerts, chatbot interaction, and multi-device management within one platform. This fragmentation makes it difficult for users to manage their devices efficiently and reduces the overall effectiveness of existing solutions[33].

Dependence on Continuous Internet Connectivity
The literature also shows that many current tracking systems depend heavily on continuous internet access. These systems often rely on cloud-based services to send location updates, deliver alerts, and update dashboards. While this may work in stable network environments, it becomes less effective in areas with weak or unstable connectivity. As a result, users may experience delayed notifications or incomplete tracking information, which limits the practicality of such systems[34].

Limited Prediction and Intelligence

Another important observation is that many existing systems provide only basic GPS location monitoring without analyzing movement history or predicting the likely future location of a device[35]. Although current position tracking is useful, it does not fully support proactive recovery. The literature therefore suggests a need for more intelligent systems that use machine learning to improve prediction accuracy and support faster decision-making in recovery situations[36].

Limited User-Friendly Interaction

The reviewed studies also indicate that several tracking platforms have technical interfaces that may be difficult for ordinary users to operate, especially in emergency situations[37]. The absence of conversational tools such as AI chatbots can make it harder for users to request updates, activate security features, or understand device status quickly. A more interactive and simpler user interface would improve accessibility and usability for a wider group of users[38].

Limited Real-World Evaluation
Finally, many studies are evaluated mainly through technical demonstrations rather than through extensive real-world testing[39]. Most research focuses on whether the system can track a device or send alerts, but fewer studies examine long-term reliability, user satisfaction, or effectiveness in actual recovery scenarios. This shows the need for more practical and thoroughly tested tracking solutions that can perform well in everyday use[40].

4.0 CONCLUSION

This study has examined the design and relevance of the Track My Device with AI Assistant system as an integrated solution for improving device security, monitoring, and recovery. Although existing tracking technologies provide certain benefits such as basic location monitoring, alarm activation, or remote locking, many users still experience challenges because these solutions are often fragmented and do not fully address real-time monitoring, predictive tracking, intelligent alerts, and conversational interaction within a single platform. The proposed system responds to these limitations by combining real-time GPS tracking, machine learning-based movement prediction, geofencing alerts, SIM card change notifications, low battery warnings, remote lock functionality, alarm activation, and an AI chatbot for user interaction. By integrating these features, the system supports timely decision-making, strengthens anti-theft protection, and improves the chances of recovering lost or stolen devices.
Ultimately, the Track My Device with AI Assistant system demonstrates the practical value of combining artificial intelligence, real-time tracking, and user-friendly design into one cohesive platform. It enables users to monitor device status, respond quickly to suspicious events, and manage multiple devices through a centralized dashboard. The system is expected to improve convenience, enhance security, and reduce the risks associated with device loss in everyday use. For maximum impact, future development should focus on robust implementation, usability, and adaptability across different device types and user contexts, ensuring that the platform remains reliable, accessible, and effective for a wide range of users.

5.0 RECOMMENDATIONS AND FUTURE WORKS

1. Future Research Directions
Future research should focus on improving the intelligence and adaptability of the proposed Track My Device with AI Assistant system. One important direction is the development of a more modular and scalable architecture that can support different tracking, alerting, and security functions without affecting system performance. Researchers may also explore

lightweight artificial intelligence models that can run efficiently on low-cost smartphones or resource-constrained devices, especially in environments where processing power and battery capacity are limited. In addition, future studies should investigate more accurate movement prediction techniques that can better anticipate device location based on user behavior and historical movement patterns.

Another important area for future work is the development of robust datasets for training and testing device tracking models. High-quality datasets that reflect real-world movement behavior, theft scenarios, and device usage patterns would improve the accuracy and reliability of prediction and alert mechanisms. Future research should also examine the long-term performance of such systems in practical settings, including their effectiveness in improving recovery rates, reducing device loss, and enhancing user satisfaction. These studies would help determine the real-world value of integrating artificial intelligence into device tracking and security.

2. System Implementation Recommendations

The proposed system should be designed with a user-friendly interface that allows users to navigate its functions easily, even if they have limited technical knowledge. The dashboard should clearly display device location, battery level, security status, and alert history in an organized format. Since users may need to respond quickly during emergencies, the interface should prioritize simplicity, clarity, and fast access to critical functions such as remote lock, alarm activation, and location updates. The inclusion of an AI chatbot should also be carefully implemented to ensure that users can interact with the system through natural and understandable conversational commands.

The system should also be built to operate effectively under different network conditions. Since device loss or theft may occur in areas with weak connectivity, the system should support offline or low-connectivity operation where possible, with automatic synchronization once a connection is restored. Real-time data updates should be prioritized for alerts and tracking information, while the system should also be optimized to minimize battery consumption. These design choices would improve reliability and make the system more practical for everyday use.

The system should include an offline tracking feature that can help users locate a device even when internet connectivity is unavailable. For example, Bluetooth-based proximity tracking or nearby device detection can be used within a limited area to help users identify the approximate location of a misplaced device. This would improve the practicality of the system in situations where network access is weak or the device is temporarily offline.

3. User and Security Recommendations

Users should be encouraged to activate all available security features, including geofencing, SIM change notifications, remote lock, and alarm alerts, to maximize protection. Clear guidance and onboarding support should also be provided to help users understand how to use the system effectively. For households, institutions, or businesses managing multiple devices, the multi-device dashboard should include sorting, filtering, and notification settings so that users can monitor each device efficiently. This would improve usability and reduce the risk of overlooking important alerts.

Security and privacy should remain central in the implementation of the system. Since device tracking involves sensitive data, the platform should use secure authentication, encrypted communication, and controlled access to protect user information. Regular system updates and maintenance should be carried out to improve performance, fix security vulnerabilities, and adapt to changing user needs. In this way, the system can remain effective, trustworthy, and sustainable over time.

4.2 Figures and Tables

Table 1 shows the core database structure of the system, highlighting key entities, their attributes, and relationships used to support real-time tracking, alert generation, and intelligent prediction.

Table 1: database structure of the system

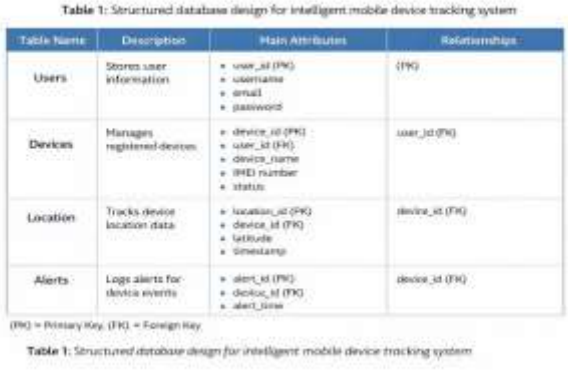

Table 1: Structured database design for intelligent mobile device tracking system

Table Name	Description	Main Attributes	Relationships
Users	Stores user information	• user_id (PK) • username • email • password	(PK)
Devices	Manages registered devices	• device_id (PK) • user_id (FK) • device_name • IMEI number • status	user_id (FK)
Location	Tracks device location data	• location_id (PK) • device_id (FK) • latitude • timestamp	device_id (FK)
Alerts	Logs alerts for device events	• alert_id (PK) • device_id (FK) • alert_time	device_id (FK)

(PK) = Primary Key, (FK) = Foreign Key

Table 1: Structured database design for intelligent mobile device tracking system

Figure: Workflow diagram illustrating an intelligent device tracking system integrating user, mobile device, GPS tracking, AI server for prediction and analysis, and alerts system.

Fig. 1. *System Work flow*

Figure 1: Show system workflow demonstrating how the user interacts with the mobile device and dashboard interface, while GPS tracking provides real-time location data to the AI server. The system processes and stores data in the database, performs predictive analysis, and generates alerts such as SIM change, geofencing, and low battery notifications.

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